

What is claimed is:

1. A CMP slurry composition for oxide films comprising: a solvent; an abrasive dispersed in the solvent; and an HXO_n compound (wherein n is an integer from 1 to 4).

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2. The CMP slurry composition for oxide film according to claim 1, wherein the abrasive is colloidal or fumed SiO_2 having a grain size of 20 to 300 nm.

10 3. The CMP slurry composition for oxide film according to claim 1, wherein the abrasive is Al_2O_3 .

4. The CMP slurry composition for oxide film according to claim 1, wherein the abrasive is CeO_2 .

15 5. The CMP slurry composition for oxide film according to claim 1, wherein the slurry composition has pH below 7.

6. The CMP slurry composition for oxide film according to claim 5, wherein the slurry composition has pH of 2 to 5.

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7. The CMP slurry composition for oxide film according to claim 1, wherein X of the HXO_n compound is selected from the group consisting of F, Cl, Br and I.

25 8. The CMP slurry composition for oxide film according to claim 1, wherein the HXO_n compound is selected from the group consisting of HClO , HClO_3 , HClO_4 , HBrO_3 , HIO_3 and HIO_4 .

9. The CMP slurry composition for oxide film according to claim 1, wherein the HXO_n compound is present in an amount ranging from 0.01 to 10 wt% based on the CMP slurry.

5 10. The CMP slurry composition for oxide film according to claim 9, wherein the HXO_n compound is present in an amount ranging from 0.1 to 5 wt% based on the CMP slurry.

10 11. The CMP slurry composition for oxide film according to claim 1, wherein a polishing selectivity ratio of the slurry composition for a nitride film to an oxide film ranges from 1:1 to 1:3.

15 12. The CMP slurry composition for oxide film according to claim 1, wherein a polishing selectivity ratio of the slurry composition for a nitride film to an oxide film ranges from 1:1 to 1:2.

20 13. The CMP slurry composition for oxide film according to claim 7, wherein a polishing selectivity ratio of the slurry composition for a nitride film to an oxide film ranges from 1:1 to 1:3.

14. The CMP slurry composition for oxide film according to claim 10, wherein a polishing selectivity ratio of the slurry composition for a nitride film to an oxide film ranges from 1:1 to 1:2.

25 15. A method for forming a metal line contact plug of a semiconductor device, comprising the steps of:

depositing a conductive material for word line on a semiconductor substrate;

forming a word line pattern by depositing a hard mask nitride film on the overlap portion of the conductive material for word line;

forming a nitride film spacer at the side of the word line pattern;

forming a planarized interlayer insulating film on the word line pattern;

forming a contact hole by etching the interlayer insulating film until the substrate is exposed;

5 forming a silicon layer on the entire surface of the interlayer insulating film having the contact hole; and

performing a CMP process on the silicon layer and the interlayer insulating film, by using a CMP slurry composition for oxide film of in claim 1 until the hard mask nitride film is exposed.

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16. The method according to claim 15, wherein the conductive material for word line is selected from the group consisting of doped silicon, polysilicon, tungsten (W), tungsten nitride (WN), tungsten silicide (WSi_x) and titanium silicide (TiSi_x).

15 17. The method according to claim 15, wherein the word line pattern is formed by an etching process using CCl₄ or Cl₂ gas.

18. The method according to claim 15, wherein the spacer is formed by using TEOS(tetraethoxysilicate glass) or silane(SiH₄)-base oxide film.

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19. The method according to claim 15, wherein the interlayer insulating film is selected from the group consisting of BPSG(borophosphosilicate glass), PSG(phosphosilicate glass), FSG(fluorosilicate glass), PE-TEOS(plasma enhanced tetraethoxysilicate glass), PE-SiH₄(plasma enhanced-silane), HDP USG(high density plasma undoped silicate glass), HDP
25 PSG(high density plasma phosphosilicate glass) and APL(atomic planarization layer) oxide.

20. The method according to claim 15, wherein the contact hole is formed by an etching process using C₄F₈, C₂F₆ or C₃F₈ source.

21. The method according to claim 15, wherein the silicon layer is formed of a doped silicon or polysilicon using SiH_4 or Si_2H_6 source.

22. The method according to claim 15, wherein the CMP process is performed by
5 using a hard pad.